

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
25 March 2004 (25.03.2004)

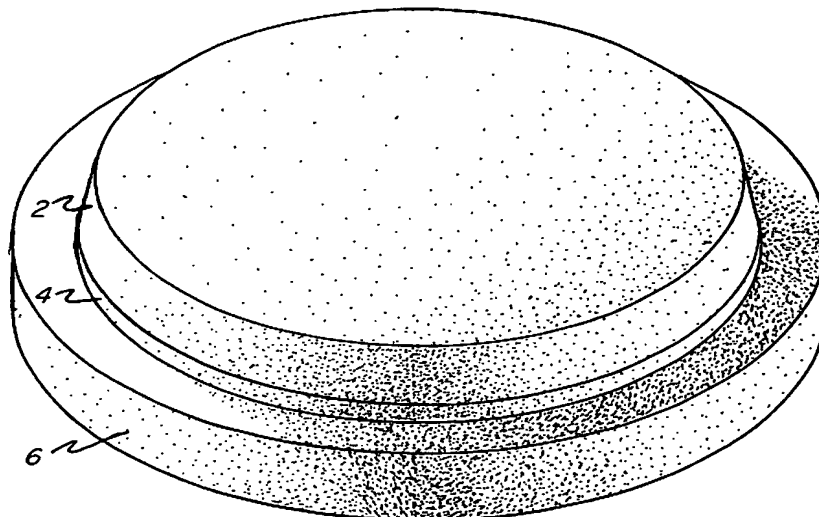
PCT

(10) International Publication Number  
**WO 2004/024452 A2**

- (51) International Patent Classification<sup>7</sup>: **B41J** 43123 (US). VALENT, Francis, S. [US/US]; 6023 Epernay Way, Galloway, OH 43119 (US). REGAN, Michael, J. [US/US]; 3210 NW Arrowood Circle, Corvallis, OR 97330 (US).
- (21) International Application Number: PCT/US2003/027145
- (22) International Filing Date: 27 August 2003 (27.08.2003) (74) Agent: PEACOCK, Bruce, E.; Wegman, Hessler & Vanderburg, 6055 Rockside Woods Boulevard, Suite 200, Cleveland, OH 44131 (US).
- (25) Filing Language: English
- (26) Publication Language: English (81) Designated States (*national*): JP, US.
- (30) Priority Data: 60/410,607 13 September 2002 (13.09.2002) US (84) Designated States (*regional*): European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR).
- (71) Applicants (*for all designated States except US*): TOSOH SMD, INC. [US/US]; 3600 Gantz Road, Grove City, OH 43123 (US). HEWLETT-PACKARD CO. [US/US]; 1000 NE Circle Boulevard, Corvallis, OR 97330-4239 (US). Published:  
— without international search report and to be republished upon receipt of that report
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): SMATHERS, David, B. [US/US]; 3298 Kirkham Road, Columbus, OH

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: PROCESS FOR MAKING DENSE MIXED METAL Si<sub>3</sub>N<sub>4</sub> TARGETS



(57) **Abstract:** A composition and method for fabricating high-density Ta-Al-O, Ta-Si-N, and W-Si-N sputtering targets, having particular usefulness for the sputtering of heater layers for ink jet printers. Compositions in accordance with the invention comprise a metal component, Si<sub>3</sub>N<sub>4</sub>, and a sintering aid so that the targets will successfully sputter without cracking, etc. The components are combined in powder form and pressure consolidated under heated conditions for a time sufficient to form a consolidated blend having an actual density of greater than about 95% of the theoretical density. The consolidated blend may then be machined so as to provide the final desired target shape.